Appendix 7

Response to Comments

RESPONSE TO COMMENTS.

Three comment letters were received regarding the Mid-Salmon/Chamberlain Subbasin Assessment and Crooked Creek TMDL during its public comment period (January 17, 2001 to February 19, 2001). We have listed the substantive comments below (in italics) followed by IDEQ's reponse. Those comments that are typographical in nature are not listed, however, appropriate changes have been made to the document.

Nez Perce National Forest

> *We concur with most of the findings in the subbasin assessment. The TMDL is properly focused on upper Crooked Creek, which is the most highly impacted subwatershed within the Nez Perce National Forest portion of the subbasin. Whether this segment should have been delisted for sediment is arguable. However, implementing the water temperature TMDL would logically result in a watershed restoration plan that addresses sediment and channel morphology concerns, as well as riparian shade and water temperature.*

DEQ Response: Because sediment criteria in Idaho's water quality standards rely heavily upon narrative "free from" statements, it is often difficult to ascertain violations of standards for sediment pollution. Based on our analysis of BURP biomonitoring data, we were not able to detect serious beneficial use effects from sediment pollution. We are not saying there has been no affect due to elevated sediment loading. Rather we are saying the effects are not so severe as to violate water quality standards.

To produce accurate total maximum daily loads for sediment would require substantially more information than is available on either suspended or bedload sediment, or both to produce loadings based on mass/time or concentration, or on appropriate target surrogates. In order to commit to such work in the limited time frame established by the court-ordered TMDL schedule, serious beneficial use impairment should be realized.

We agree that addressing temperature should result in actions that improve sediment loads as well. Temperature data are easier to compare to numerical standards to determine violations. However, even with temperature there are substantial problems with application of standards in inappropriate areas. Often their application is based on legal requirements rather than actual biological necessities.

> *Executive Summary – The referenced Nez Perce NF sediment analysis of the main stem Salmon River incorporated additional information beyond NEZSED modeling. It included other data such as USGS sediment and streamflow data and BOISED modeling results provided by the Payette NF.*

Executive Summary - The summary should state that the main stem Salmon River is recommended for removal from the 303(d) list.

DEQ Response: We have made the requested changes to the executive summary.

Page 13 – The contention that water temperature in upper Crooked Creek is too high due to timber harvesting is suspect. To our knowledge, there is no conclusive evidence to support this and we could not find that particular statement in the referenced Bull Trout Problem Assessment. We acknowledge that there is a high level of development in upper Crooked Creek, including riparian encroaching roads, stream channelization, residential development, mining, and timber harvest. These impacts, combined with natural factors, are likely working together to produce the observed water temperature conditions.

DEQ Response: It was not our intent to implicate timber harvesting as an industry or activity, but it was to suggest that removal of vegetation from the valley of upper Crooked Creek as a result of a whole variety of activities led to the subsequent water temperature problem. However, the commentor is correct in that we did not accurately reflect the nature of the problem. We have made necessary changes to the document.

Pages 13-14 – We do not suggest connecting a lack of documented bull trout spawning to high temperatures originating in the upper watershed. Temperatures in lower and middle Crooked Cr are probably more affected by aspect shading and the temperature and flow of Lake Cr. There is very little bull trout survey information for the Crooked Cr watershed. The only documented bull trout in the watershed were some reported in lower Crooked in IDFG's parr monitoring work. Bull trout have never been reported in upper Crooked Cr, but could be present as a small resident population in some obscure second-order tributary. If we find a "real" population of bull trout in Crooked Cr watershed, we suspect they'll be in one of the Big Cr or lower Lake Cr tributaries.

DEQ Response: In both EPA's promulgated rule regarding Idaho's water quality standards and in Idaho's standards themselves, bull trout criteria are applied to the whole Crooked Creek watershed regardless of actual presence of the species. We attempted to make rational connections in the subbasin assessment where possible to correct or concur with this broad sweeping approach to water quality standards setting. Ideally, it would have been beneficial to know if in fact bull trout spawn anywhere in Crooked Creek and to apply the temperature criteria only to those portions where they actually spawn. We were unable to do that. Therefore, we assume bull trout spawning (or salmonid spawning in the case of other species) occurs in the locations where these species are observed. Because bull trout are suspected to be present in lower Crooked Creek, spawning is likewise suspected, at least in the context of applying spawning temperature criteria in water quality standards.

Because other salmonids are suspected to be present in upper Crooked Creek, salmonid spawning temperatures apply there as well.

The question of whether or not higher stream temperatures in the upper watershed affect bull trout spawning in the lower watershed is unanswerable at this point without further study of the temperature balance in the stream. The commentor may indeed be correct that lower watershed stream temperatures are more affected by aspect shading and the temperature and flow of Lake Creek than by stream temperatures in the upper watershed. However, improvements in water temperature at the upper watershed will benefit salmonid spawning in that area.

Page 14 – DEQ might want to contact Rob Leary (note the misspelling "Leery" in the document) of the Payette NF regarding the redband population in Fivemile Creek. Dave Mays' interpretation of this paper is that there are some differences in the Fivemile Creek population, but not to the extent portrayed in the Assessment.

DEQ Response: Because Fivemile Creek is not a 303(d) listed stream in this subbasin, and the contribution of this information is relatively inconsequential regarding water quality and total maximum daily loads, the questioned information has been removed from the subbasin assessment.

Page 14 – Juvenile steelhead are also found in lower Sheep Creek. Also, critical habitat for spring/summer chinook and steelhead is mentioned for Chamberlain Creek and West Fork Chamberlain Creek, but also exists in other streams in the subbasin.

Page 15 - Commercial logging is not planned in the foreseeable future in the area between the GH and Frank Church Wildernesses.

Page 17 – For consistency, the segment of the Salmon River coded on Map 10 as "Wild River" only could be split in mid-river to show the "Wild River/FCRONR Wilderness" on the south side. A simpler option would be show the entire classified river reach as "Wild River" since the adjacent designations are already depicted. Although the Wild and Scenic River and Wilderness designations overlay each other on the ground, Forest Service management of the river corridor is premised on the senior designation, which is Wild and Scenic River in this case.

Page 18 – Not all of the NPNF subwatersheds have road densities < 1 mi/mi^2.

Page 21 – The mean annual and mean monthly flows referenced from NPNF, 1994 are estimates based on regional equations and reference stream gages. They should be portrayed as "estimated". This comment also applies to other pages where the same data are referenced. This was an oversight in the NPNF source document.

Page 22 - The way the first paragraph is written, it appears grazing and other management is solely responsible for high fine sediment levels. Road construction probably has had the greatest contribution to fine sediment of any management action. The watershed is also composed of highly erosive geology, which may account for most of the sediment levels.

Page 24 – The War Eagle Mine is located southwest of Big Creek, but does not drain into Big Creek. It is located along Fitz Creek, which drains into lower Crooked Creek.

Pages 22- 27 – California and Warren Creeks, as well as smaller watersheds on the south side of the Salmon River, were affected by the Burgdorf Fire in 2000. A summary of changed conditions from this fire should be provided. Information can be obtained from the Payette NF.

Page 31 – It is incorrect to say that the 1992 Watershed Condition Analysis criteria have not been used since that time. The results of this analysis have been used for many purposes. However, it is correct to say that the analysis has not been updated since 1992 using the identical set of criteria.

Page 45 – The reference for the six defined objectives should be given.

Page 49 – A map of the Crooked Creek watershed, showing sites 1-4 and the major tributaries would be helpful.

Page 49 – A reference should be provided for the CWE procedure.

DEQ Response: We have made the necessary changes to the document for all of these comments.

Page 51 – The assumptions and limitations of the CWE regression equation should be summarized. It would be interesting to know how different the results might be if the north Idaho temperature model were applied, since Crooked Creek is in a transition zone.

DEQ Response: The CWE model was abandoned in favor of EPA's effective shade modeling.

Page 58 – Should there be some discussion of the approach and timing to be used to develop an implementation plan for the TMDL?

DEQ Response: While it can be beneficial to address the approach and timing of implementation in the TMDL, such is not a requirement for approval under current regulations. There is also a largely practical consideration of completing an aggressive eight-year schedule on time. So, as a matter of policy DEQ has not been including implementation plans with TMDLs sent to EPA for approval. This is not to say implementation plans are not essential, but recognizes they often take considerable more time to negotiate than is allowed under the TMDL submittal schedule. Furthermore, how load reductions are to be achieved is more the province of land management agencies, individual stakeholders and point sources, than it is of DEQ. Thus it is DEQ's intent that implementation plans follow an EPA approved TMDL within 18 months, lead by designated management agencies for non-point sources and any point sources in the drainage. In the Crooked Fork this lead logically lies with the Forest Service in cooperation with the Idaho Department of Lands, the designated management agency in Idaho for forestry and mining related pollution.

Nez Perce Tribe

Waterbody Assessment Guidance

Of major concern to the Tribe is the continued reliance this subbasin assessment places on the 1996 Waterbody Assessment Guidance (WBAG). The assessment utilizes this WBAG to make significant determinations, including the decision to delist for sediment the waterbodies in the subbasin that were on the approved 1998 303(d) list.

As you know, the Environmental Protection Agency (EPA) has expressed strong concern with the WBAG. In fact, IDEQ is currently completing the development of a new assessment process. Allowing continued use of the 1996 WBAG prevents the meaningful achievement of the Clean Water Act's goals of restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters.

Given the development of a new WBAG, the Tribe would recommend that IDEQ postpone finalization of this document pending approval of the new assessment guidance. While the Tribe recognizes that IDEQ is under a court approved schedule for completing Total Maximum Daily Load (TMDL) analyses for which the subbasin assessments are the basis, there is a process for seeking an extension of the deadline. Further, given the ongoing lawsuit over the TMDL schedule, there may be an opportunity to seek an extension through settlement discussions with the EPA and the plaintiffs. Compromising the scientific and legal defensibility of a decision not to pursue TMDLs for sediment in order to meet the TMDL schedule is not consistent with the goals of the Clean Water Act and with IDEQ's legal obligations to produce TMDLs that will lead to achievement of water quality standards.

DEQ Response: Assessing the BURP data collected for this subbasin with the new Water Body Assessment Guidance (WBAG II) is warrented. We have included the information in the subbasin assessment and Appendix 8, the conclusions drawn from our WBAG II assessment is the same. In fact, these listed streams, including Crooked Creek, had some of the highest scores attainable under the WBAG II process. The fact remains that Crooked Creek would assess as not supporting salmonid spawning because of temperature criteria violations.

Insufficient data

In several instances the document states that there is insufficient data available for the tributary in question. When there is insufficient data, the scientifically correct conclusion is not that water quality standards are met because there is no data to show that they are not, but rather that further investigation is needed. Also, output from the NEZSED model, the results of which the document states have a great deal of uncertainty, ought not to be used without field verification. Similarly, the document states that there is speculation that some exceedances of water quality standards are due to natural conditions. In the absence of data clearly supporting such claims, they are as stated simply speculation.

DEQ Response: We agree that further investigation would provide a clearer picture. In order to more accurately perform these assessments and analyses, more data and further investigation would be helpful. However, we often do not have that luxury and must make due with the level of information that is available at the time. In this particular case, we relied heavily upon our own biomonitoring results, the Forest Service sediment yield modeling, and the fact that substantial portions of the subbasin is in wilderness status. None of these processes is perfect or infallible, however, together they provide sufficient evidence that these streams, relative to other streams in the state, are in reasonably good shape.

Sediment criteria

Since the sediment criteria are mainly narrative, it can be difficult to clearly define what conditions constitute a violation of that standard. In addition, as stated in the document, turbidity and intergravel dissolved oxygen, two quantitative measures used in assessing sediment, are rarely used in the backcountry that comprises most of this subbasin.

To address this problem, the Cottonwood Creek TMDL document used surrogate sediment measures for their coarse sediment TMDL. Those measures included bankfull channel width to depth ratio, pool frequency, residual pool volume, and depth fines. Such data could well apply in this subbasin. These surrogate measures are a more quantitative determination of support of beneficial uses than the macroinvertebrate index (MBI) and

habitat index (HI) used in the assessment. MBI does not accurately reflect local conditions, and HI is very subjective.

DEQ Response: The Cottonwood Creek TMDL may have used such surrogate measures in determining coarse estimations of load, however, Cottonwood Creek was originally assessed as not supporting uses by the same 1996 WBAG process used here. Only after it was demonstrated through assessment of BURP data that Cottonwood Creek is indeed impacting uses and in need of a TMDL were surrogate measures used to produce the actual TMDL. This is usually out of necessity for the lack of other kinds of data. The surrogate measures themselves cannot provide enough information on the impacts to beneficial uses.

Big Creek: *The document states that there are localized impacts from grazing, including bank sloughing, loss of cover, sedimentation, and soil compaction in this basin, but that the impacts are considered minor with little impact on overall Crooked Creek watershed condition. Is there quantitative data to support this conclusion?*

Big Mallard Creek: *This creek is of concern due to the presence of chinook juvenile rearing or spawning and steelhead. According to the document, there are high levels of deposited sediment in the sub-watershed, and some evidence of damage to streambanks. The past and present timber harvest and grazing in this sub-watershed likely contribute to that sediment. Measures of habitat quality as determined in the National Marine Fisheries Service's "Matrix of Pathways and Indicators of Watershed Condition" (Matrix) as adapted by the Cottonwood BLM, Clearwater National Forest, and Nez Perce National Forest provide a means to further assess Big Mallard Creek. In that sub-watershed, cobble embeddedness above the falls is 40 to 80%. According to NMFS's Matrix, cobble embeddedness greater than 30% is an indicator of low habitat quality. That same document lists percent fines greater than 25% as an indicator of low habitat quality. According to data in Table 7, several reaches of Big Mallard Creek have percent fines above that value. These data call into question the conclusion that beneficial uses are being supported.*

Little Mallard Creek: *The extent of the presence of chinook juvenile rearing or spawning is not clear from the document. There are seemingly contradictory statements regarding their presence. The impact of the hydropower plant is also not clear. The stated cobble embeddedness of less than 25% falls within the NMFS Matrix range for moderate habitat quality. The range of percent fines, 17 to 35, covers all NMFS Matrix habitat quality groups. Although those numbers are decreasing, we agree that there is too little data to say there is a trend. Data in Table 13, however, seem to indicate there are parts of Little Mallard Creek with very high percent fines. Here again, more data seem to be needed.*

Rhett Creek: *This is another sub-watershed with spring/summer chinook rearing that has significant habitat degradation, mostly due to mining impacts. As stated in the document, the Black Diamond Mine is active and contributing sediment to a tributary of Rhett Creek. The Robinson Creek Mine in the upper watershed was still a source of sediment in 1994, and it is likely that the sediment will move through the system to lower reaches. There is also sediment from placer mines, timber harvest, and roads. Additional timber harvests are planned. In upstream reaches where mining activities are taking place, we question the conclusion that beneficial uses are being supported.*

Jersey Creek: *The document states that parts of this sub-watershed were clear cut, there was past mining activity, and light grazing is occurring. The extent of these activities, however, is not given. Since there are anadromous fish several miles above mouth, the possible sediment impacts from these activities is of concern. It seems that more data is needed to determine whether sediment is a water quality problem.*

DEQ Response: The document states that clear cutting amounted to 96 acres or less than one percent of the Jersey Creek watershed, which is a relatively small area. Observations and descriptive language found in agency documents cannot be substantiated or concluded as violations of water quality standards. Often an agency document will report that a stream has been "affected" or "impacted" by some activity, or that sediment is high in areas, however the degree may be highly variable. Water quality standards act as threshold values for pollutants the violation of which can be identified by impaired uses. We relied upon assessment of BURP data and Forest Service sediment yield modeling to guide us on whether or not sediment loads to a creek were adversely affecting beneficial uses and violating water quality standards.

Crooked Creek: *This is another sub-watershed of particular concern due to the presence of chinook juvenile rearing or spawning, and its importance in terms of fish production. The area has several known significant habitat impacts. As the document states, the biggest impact is from dredge mining. The history of mining along with the presence of unvegetated tailings indicate a likelihood of water quality degradation from acid mine drainage and toxic metal or chemical contamination. The Nez Perce Tribe would like to encourage data collection to ascertain whether or not these pollutants exist in waters adjacent to and downstream from mining areas.*

Mining along with other habitat disturbances in the sub-watershed are likely contribute to sedimentation. Since the 1992 Porcupine Creek fire in the wilderness portion of the sub-watershed, numerous debris torrents and other mass movement events have been documented. The document also states that there is high sediment delivery and deposition in upper reaches. Past timber harvesting and grazing, which are often sources of

sediment to streams, have occurred in the area. In addition, the entire length of Crooked Creek outside of the wilderness is paralleled by roads, another major source of sediment.

The existing data for the sub-watershed indicate that sedimentation is a water quality problem. The document states that in 1987-88 there was high existing sediment deposition. Cobble embeddedness as given in the document is 53 to 67%, which is above the 30% given in NMFS's Matrix as indicating of low habitat quality. In addition, the document states that in upper Crooked Creek there are low pool to riffle ratios, a lack of woody debris, and poor stream channel conditions with large amounts of sediment running through the system. Even the macroinvertebrate assemblages indicated that Crooked Creek is experiencing some impact from sediment. This does not sound like a sub-watershed where sediment is not a water quality problem. At the very least, habitat indicators clearly reflect that beneficial uses are not being supported.

DEQ Response: Crooked Creek is indeed affected by sediment pollution, especially in the upper watershed where development and a century of placer and dredge mining has taken place. This type of mining usually does not result in, and we are not aware of, acid mine drainage or an excess of heavy metal pollution in this watershed. The degree to which the sediment in the system created by these activities is impacting beneficial uses is not a forgone conclusion as a consequence of presence of the activities. Yes, sedimentation has been increased, and likely was even greater during the era of extensive mining, and is now improving. Assessment of BURP data indicates that these streams are supporting their uses. The surrogate measures mentioned do suggest that there is still sediment moving through these systems as a result of activities and from naturally erosive geology. However, these measures have not been reliable in directly translating into beneficial use impacts. High cobble embeddedness, for example, does not necessarily mean uses are not supported.

Warren Creek: *According to the document, this area has major habitat impacts associated with a long history of both placer and lode mining activities. It has been extensively dredge mined with dredge piles in the upper basin confining the stream. Dredged areas also lack vegetation, increasing the likelihood of sediment being washed into the stream and the leaching of toxic materials, especially since many ore and/or tailings piles border streams. In addition, as the document states, the dredged areas lack pools, winter habitat, overhead vegetation, and woody debris. The four active lode mines as well as past lode mining sites are additional likely sources of acid mine drainage and toxic metal contamination. Roads to mines and timber harvest also add sediment and pollutants to the stream.*

The document acknowledges the habitat degradation in Warren Creek, but based on MBI and HI values alone considers this sub-watershed as fully supporting its aquatic life uses. Habitat factors, though, point to poor habitat quality in the mined areas of the sub-watershed. The Nez Perce Tribe suggests that sediment surrogates be used to further evaluate sedimentation, and that acid mine drainage and toxic metal contamination be investigated.

DEQ Response: Warren Creek is listed on the 1998 303(d) list as impaired due to habitat alteration. The stream was not listed for sediment. Assessments of BURP data and Forest Service inventory of percent fines (15%) suggested to us that the stream did not have a serious sediment problem requiring us to address this unlisted pollutant. However, we do agree that the affects a mining activities have demonstrably altered the habitat around Warren Creek. We believe Warren Creek should stay on the 303(d) list for habitat alteration. This was incorrectly addressed in the document. We have modified the document to state that Warren Creek should remain on the 303(d) list for habitat alteration. However, there is no load reduction a TMDL can specify for Warren Creek that will lead to improved habitat conditions. This will require active restoration efforts beyond the scope of a TMDL.

Crooked Creek TMDL

It is not clear that a model developed for southern Idaho is truly applicable to the Crooked Creek sub-watershed. Regardless, it is important to field check model results. It must be kept in mind that model output numbers are always estimates. The Nez Perce Tribe suggests that other methods to decrease stream temperatures in addition to increasing canopy cover be considered. Decreasing stream width to depth ratios is mentioned in the "Load Allocation" section, but is it not clear if that approach will be investigated.

DEQ Response: The CWE model has been replaced by effective shade modeling.

We agree that decreasing width-to-depth ratios may be an important mechanism for improving stream temperatures. The document inadvertently described it as "increasing" width-to-depth ratios. This has been corrected. In this case, the degree to which changes in width-to-depth ratio will be employed as a means of correcting the problem is a matter for the implementation plan to address.

Environmental Protection Agency

General Comments on the Subbasin Assessment

Given the documented problems described for many of the tributaries, the fact that they are judged to be fully supporting their beneficial uses needs some additional explanation.

It is not enough to say that disturbance is relatively low compared to other parts of the state or that much of the sub-basin is designated wilderness. There are multiple lines of evidence that point toward environmental effects of fine sediment in some locations. It would help to describe how the locations where the beneficial uses were evaluated are spatially related to the disturbances described in the text.

If the disturbances are relatively localized in relation to the scale of the watersheds, is there any way to quantify that to provide a better perspective on watershed condition? Some assurance that the locations selected for beneficial use evaluation are representative of the overall condition of the stream segment would strengthen this position. For three of the streams, there were evaluations of both upper and lower parts of the segment, so it looks like some efforts were made to address this issue.

DEQ Response: DEQ BURP monitoring procedures attempt to sample streams in at least two locations, an upper watershed site and a lower watershed site, whenever possible. However, access problems tend to limit when that occurs. In these particular streams, access is limited by roadless areas. Crooked Creek, for example, has two BURP sites, one near the wilderness boundary at the end of the access road, and the other 4-5 miles upstream closer to the town of Dixie. However, both sites are below the major points of impact for that stream. Two sample locations were obtained for other streams in the subbasin including Big Creek, Warren Creek, and Big Mallard Creek. However, only one sample location was obtained from each of Jersey Creek, Rhett Creek, and Little Mallard Creek. Most streams were sampled near their mouth with the exception of Rhett Creek, which was sampled in the middle of the watershed.

We have used the sub-watershed description section as a way to communicate what land management agencies have said about past and present activities and conditions in the watershed. We expect this information to be anecdotal and treat it as such. There is no way to interpret what others may describe in terms of water quality standards violations or beneficial use impairment. In order to assess whether or not the stream is meeting standards or protecting beneficial uses, we rely on our water body assessment process and actual data provided by management agencies that demonstrates a problem. In this particular case, we did not see sediment problems sufficient to require a TMDL for sediment. The descriptions of disturbances in watersheds may be localized, historic, or otherwise not affecting the biology of the streams as measured by our assessment process.

Our choices at this point are to go through the document and eliminate this anecdotal information or to describe it as anecdotal and let it remain in the document. We have chosen the later.

Specific comments / suggestions

P 1. "Warren Creek... cannot receive a load allocation for habitat alteration. No TMDL is provided." I suggest adding text explaining that no TMDL is required for a stream listed only for habitat alteration.

P 7. The text refers to the Idaho batholith, but the batholith is not specifically denoted on the geologic map. It would help to clarify by adding text to be specific. (Not all readers will know that the batholith is of Cretaceous age, which is how it is labeled in the map legend.) Alternatively, the map legend could be changed, but it seems easier to clarify in the text. Also, since the batholith is known to develop into erosive soils, it would be useful to know what proportion of the sub-basin is underlain by batholithic rocks.

P 13. The document states that "there may be other portions of the sub-basin burned this year before the fire season is complete." This reference was to the 2000 season, so it seems likely it could be updated by now.

P 18. The reference to the natural sediment yield needs a citation and a brief description of how the estimate was derived (NEZSED?) and what parameters it is based on.

DEQ Response: We have modified the text to present things more clearly and to address these comments.

P 36. According to the Nez Perce NF, Warren and upper Crooked creeks are "targets for rehabilitation." Is there any additional information that could be provided here regarding the type and scale of the rehabilitation?

DEQ Response: This particular question led us to discover that most of the dredged areas in Warren Creek are in private holdings and are not targeted for any kind of restoration. The Payette National Forest is doing some trail relocation and road maintenance work in the Warren Creek drainage, but not directly associated with the dredge mining areas. Portions of the dredged area in Crooked Creek are also in private ownership associated with the town of Dixie. The Nez Perce Forest does not have any immediate plans to do any stream restoration work in the Crooked Creek drainage as there are other higher priority places on their radar screen. The short answer is that we were incorrect, and these areas are not target for rehabilitation anytime soon.

Table 11, p 37
The table would be easier to comprehend if it were more clear what "high" and "low" refer to in some places. For example, is "high" under embeddedness referring to the degree of embeddedness or the quality of the condition as indicated by embeddedness? It seems to be the former. (With other indicators, it is more clear where the word "condition" is in the previous column, such as for width-depth ratio, where "low" means poor condition, not low ratio)

P 37-38
Model estimates indicate that the "activity-related" sediment is a very small part of the total sediment yield of the subbasin (0.05% from the north side, so even as an order of magnitude estimate, it is very small). Estimates of "accrued" sediment showed 12% as coming from human activities. A much greater proportion of the human-caused sediment is not leaving the subbasin, though the percentage is still relatively low. Why is there such a large difference? Is this primarily because so much of the "accrued" activity-related sediment has its source in the South Fork? It might be worth emphasizing this, if that is the case, since activities within the Main-Salmon-Chamberlain subbasin cannot have any effect on sediment sources elsewhere.

P 38. The dose of reality presented by the caveats in the second footnote below the sediment modeling yields is appropriate and appreciated. There has already been a lot of discussion in the document that relies on these modeling results, however, so it would be better to point out model limitations sooner in the sub-basin assessment ***B*** *at least to introduce the idea that these estimates are best used in a relative, rather than an absolute sense.*

DEQ Response: We have modified the text to present things more clearly and to address these comments.

Load Allocation for Temperature TMDL, Crooked Creek

Temperature TMDLs by nature have to be somewhat creative with regard to deriving targets and describing loading capacity and load allocations. This TMDL uses some creative approaches that are potentially useful, but it needs to provide more information in several areas.

The CWE (Cumulative Watershed Effects) temperature model needs more explanation, for example, since so much of the analysis depends upon it. How much validation has it had and where was it validated? Given that the citation in the TMDL is a personal communication from Idaho Department of Lands, additional information is needed.

Although no real citation or model documentation is provided here, EPA is currently reviewing some work that DEQ is doing comparing CWE results to SSTemp and HeatSource models and other comments on the use of the CWE model in general may be forthcoming from EPA.

As with the use of any model, one of the first steps should be to demonstrate that the model is appropriate for this particular application in this particular place. How was the model adapted for use in southern Idaho? Has the model been validated? If so, where and under what conditions was it validated and how similar is that location to the one in question?

Another step is to discuss the inherent uncertainties associated with the model, as well as to point out which input parameters it is most sensitive to. It would also help to explain the significance of the modified Palmer Drought Severity Index to the model, since that seems to be a fundamental input parameter. As I understand it, the Palmer Index is not designed for use in mountainous terrain and assumes all precipitation to be rainfall. How would this assumption be expected to affect the model results in this mountainous subbasin, where snowpack is clearly an important aspect of the basin hydrology? Would it affect model results conservatively, non-conservatively, or unpredictably? The model does not have to be discussed exhaustively, but some fundamental pieces of information are needed to strengthen the analysis.

Looking at Table 17, I see that the modeled canopy cover percentages at a given location are quite variable. For example, site 1 ranges from 51-75%, site 2 from 0-34%, site 3 from 53-88%, and site 4 from 61-97%. I assume that there were no activities or natural events that caused actual canopy cover changes of this magnitude. If that is the case, what does this variability mean in terms of the estimating capability of this model in this watershed? Do those ranges represent the inherent uncertainty in the technique, or is there something that can be done to narrow them? Would it help to compare the modeled canopy cover to some measurements of canopy cover?

On the other hand, the model results, when averaged, do show the relative differences among the sites in a consistent way that makes sense with regard to what is known about the measurement locations. What does the variability described above tell us about the absolute value of the numbers shown on Table 18? Shouldn't those also be considered to represent one point within a relatively wide range? (The table shows ranges of canopy cover of 24 to 36 percentage points for a given location.)

Even with the inherent uncertainties discussed above, the model does seem useful as a way to make a link between canopy cover and temperature standards. Using it to predict existing canopy cover based on temperature data seems a little odd, however, since canopy cover information is not too difficult to obtain either through direct measurements or estimates from aerial photography. It seems there are only two actual measurements of canopy cover reported for the watershed. Since canopy cover is the link with the targets, the analysis would be strengthened by having less uncertainty regarding the existing conditions that correspond with the temperature measurements presented.

DEQ Response: We have revised the TMDL considerably based on these comments. EPA has provided effective shade modeling to replace the CWE model. We obtained aerial photos for Crooked Creek and analyzed them for canopy cover for comparison to model predictions, and in deed found some unique results that we had not anticipated before. Finally, throughout the document we have provided better descriptions and have attempted to clarify all of the above concerns.

We have not changed the outcome of the TMDL. We believe that an increase in canopy coverage and improved channel characteristics in the affected area is all that is necessary to improve temperature.

The section on TMDL targets is difficult to understand.

Some specific suggestions:

P 51 "Sites 3 and 4 are within the wilderness area and canopy coverage estimates are considered natural." It seems that it would be useful to know what these natural canopy coverage amounts are rather than having to rely on modeled coverage percentages.

P 51 It would be helpful if you pointed out what segments the IDEQ canopy measurements were made in. The landmarks used are different for those used to describe the temperature monitoring sites.

DEQ Response: We have addressed these concern with our aerial photo analysis.

P 51 The CWE model predicts that >100% canopy cover would be required to meet the bull trout criterion at any elevation less than 6000 feet, "suggesting this criterion is unattainable in Crooked Creek." Might it not be suggesting that the model results are not very precise due to necessary simplifications and that canopy cover should be <u>maximized</u>?

Table 20 is confusing. Perhaps some additional text walking through one of the examples would make it more clear. I think the confusion is due to the combination of discussing rate of change of temperature, the number of days of exceedances, and then the "rates of change in number of days exceeding criteria." (A graph showing the temperature increase expected downstream due to elevation alone compared with the measured downstream increases would help to illustrate the rate changes as well as the differences between current conditions and conditions that would meet the temperature criteria.)

P 56 The last sentence in the first paragraph summarizes what I'm finding most confusing about this section. "The average rate of change in number of days exceeding 10EC (7 day moving average of maximum daily water temperatures) needs to decrease from 19 days to about 9 or 10 days." I would suggest how to change it if I understood what it meant. I don't actually know what it is that is changing from 19 days to 9 or 10 days. The difference in the number of "exceedance days" between two locations? Or the absolute value of the number of days exceeding the standard? It is not unreasonable to expect that the standard might be exceeded from time to time. What is important is to be clear about just how often you'd expect the standard to be exceeded. It could be expressed as a number of days per year or based on a specific statistic describing air temperature during anomalously hot summers.

DEQ Response: We have made changes to the text to provide better explanations to confusing areas.

Appendix 8

Results of the new Water Body Assessment Guidance (WBAG II)

BURPID	STREAM	ECOREGION	MBI	SMI	SMI score	SHI	SHI score	SFI	SFI score	average score
1996SIDFZ098	CORN CREEK	NORTHERN ROCKIES	4.69	69.97	3	70	3			3
1996SIDFZ099	BEAR BASIN CREEK	NORTHERN ROCKIES	3.87	53.72	2	62	2			2
1996SIDFZ100	CRAMER CREEK	NORTHERN ROCKIES	3.05	45.32	1	55	1			1
1997SLEWA013	RHETT CREEK	NORTHERN ROCKIES	4.78	87.06	3	65	2	76.23	2	2.33
1997SLEWA014	BIG CREEK(LOWER-UPPER)	NORTHERN ROCKIES	4.55	71.4	3	74	3			3
1997SLEWA015	BIG CREEK(UPPER-UPPER)	NORTHERN ROCKIES	4.2	76.77	3	71	3			3
1997SLEWA016	EUTOPIA CREEK	NORTHERN ROCKIES	4.37	77.33	3	71	3			3
1997SLEWA017	LITTLE MALLARD CREEK	NORTHERN ROCKIES	3.79	65.48	3	87	3			3
1997SLEWA018	MCGUIRE CREEK	NORTHERN ROCKIES	4.25	68.84	3	69	3			3
1997SLEWA022	WARREN CREEK(UPPER)	NORTHERN ROCKIES	4.42	75.2	3	53	1			2
1997SLEWA023	WARREN CREEK(LOWER)	NORTHERN ROCKIES	4.5	69.1	3	57	1			2
1997SLEWC011	CROOKED CREEK(LOWER)	NORTHERN ROCKIES	4.48	64.53	3	63	2			2.5
1997SLEWC012	BIG MALLARD CREEK(UPPER)	NORTHERN ROCKIES	4.82	81.97	3	71	3	38.5	1	2.33
1997SLEWC013	NOBLE CREEK	NORTHERN ROCKIES	5.03	90.98	3	83	3	98.81	3	3
1997SLEWC014	JERSEY CREEK	NORTHERN ROCKIES	4.49	69.78	3	86	3	99.07	3	3
1997SLEWC015	BIG MALLARD(LOWER)	NORTHERN ROCKIES	4.55	71.63	3	72	3	28.65	0	2
1997SLEWC016	CROOKED CREEK(UPPER)	NORTHERN ROCKIES	4.03	66.23	3	69	3			3
1999SLEWA005	BARGAMIN CREEK	NORTHERN ROCKIES	4.82	83.3	3	86	3			3
1999SLEWA006	BIG MALLARD (UPPER)	NORTHERN ROCKIES	4.67	83.61	3	78	3	58.8	1	2.33
1999SLEWA027	WIND RIVER	NORTHERN ROCKIES	5.25	86.58	3	89	3	99.5	3	3